REMARKS

The claims remaining in the application are claims 24, 26, 30-34 and 39-42. The amended claims are supported by the original claims and no new matter has been added.

Subject Matter of the Present Claims

The present invention relates to a laminated sheet or film consisting of the (co)extruded layers as defined in the present claims. The different layers are adhered to one another by the (co)extrusion. Thus, the laminated sheet or film is formed by simply (co)extruding the different layers. During the (co)extrusion the molding materials for the different layers are molten and thus adhere to one another. By the (co)extrusion process all of the layers are well bonded together. No adhesives have to be employed to bond the different layers together. Consequently, there are no adhesive layers between the (co)extruded laminated sheets or films. From the examples contained in the present application it is evident that only the molding materials for the different layers are (co)extruded to form the (co)extruded laminated sheets or films.

Rejections

Claims 27 and 28 have been rejected under 35 USC 112 as being indefinite. This rejection is respectfully traversed.

It is believed that new claims 41 and 42 are free of the points of indefiniteness the examiner found in canceled claims 27 and 28.

Claim 27 has been rejected under 35 USC 102 as being anticipated by Ellison.

This rejection is respectfully traversed.

Claim 27 has been replaced by claim 42 and so this discussion shall be directed to claim 42.

With regard to this rejection and all that follow, applicants would ask the examiner to consider the previous arguments in previous papers incorporated here by reference to simplify the record. Only the clearest errors will be described here.

The rejection over Ellison over 35 USC 102 is for anticipation. To constitute anticipation a reference must disclose each and every element of the claim, MPEP §2131. As described above the layers of applicants' laminated film are (co)extruded. That limitation is lacking in the Ellison disclosure.

The films according to Ellison contain a cast polymer film(13) which can contain pigments. It is important to use a cast polymer film in order to obtain a uniform distribution of the pigments within the film, which enables the production of high-quality decorated surfacing films, see column 2, lines 32 to 34. The cast film has to be a liquid cast film and cannot be a melt cast film or a film formed by melt extrusion, see column 4, lines 1 to 4. The liquid cast film has to be molecularly unoriented in order to achieve the desired coloring effects, see column 3, lines 50 to 51. The liquid cast film may be formed of one layer which contains the pigment. The liquid cast film may also formed of multiple layers of liquid cast molecular unoriented polymer. For example, the cast film may be formed by a combination of layers, with the outer or top layer being a transparent layer of high gloss and optical clarity, and with an underlying opaque layer

containing colored and/or metallic pigments providing the desired color, see column 4, lines 15 to 23.

Besides the liquid cast film, the decorative surfacing film according to Ellison furthermore contains a so called bonding layer. The bonding layer acts as a protective stabilizing layer and as an insulator to maintain the high quality outer surface appearance of the surfacing film and prevent the injected molten plastic from causing heat distortion or flow lines which would be visible on the out surface of the molded articles, see column 6, lines 9 to 15. The bonding layer (14) serves as a reinforcement to facilitate handling of the decorative surfacing film, placement of the film into the mold, and also ensures that it remains wrinkle free in the mold during the molding operation, see column 6, lines 3 to 9.

Thus, the decorative surfacing according to Ellison contains a liquid cast film (13) and a bonding layer (14). The bonding layer is formed of a different polymer adhered to the inner side of the cast film, see column 3, lines 32 to 33.

Please note that in the present application and in Ellison different terms are used to describe the different layers. According to the present invention the laminated sheets or films are composed of a transparent top layer and a substrate layer or a transparent top layer, an interlayer and a substrate layer. These sheets or films are then put into a mold and back cast with a back casting or back spraying polymer. Thus the substrate layer is an integral part of the sheet or the film.

According to Ellison the decorative surfacing film is composed of the liquid cast

film and the bonding layer or bonding layers. This film is shown in Fig. 2. This decorative surfacing film is placed in the mold and then back cast or back sprayed with the substrate molding material, see column 6, lines 6 to 11. Thus, the substrate layer according to Ellison is the molding material which is back cast or back sprayed in the mold in order to obtain the final molded articles.

In column 2, lines 51 to 56, it is stated that the decorative surfacing film also includes a bonding layer formed of a thermoplastic thermoformable polymer, different from the cast film. The decorative surfacing film is placed into the mold with a bonding layer oriented inwardly away from the molding surface so as to become adhered to the moldable polymer.

From this section it is again evident that the liquid cast film and the bonding layer are prepared of different polymers, so that the liquid cast film and the bonding layer have to be adhered to one another .

In order to adhere the bonding layer to the inner side of the cast film it is necessary to include an adhesive layer. From claim 1, column 8, lines 38 to 40 it is evident that said bonding layer is adhered to the inner surface of said cast polymer film by an adhesive layer between said bonding layer and said cast polymer film.

From column 5, lines 50 to 67 it is again evident that the liquid cast film is bonded to the bonding layer by using adhesives. A PVC-film can be bonded to a cast weatherable fluoropolymer film with an acrylic adhesive, see column 5, lines 62 to 64. The cast polymer film may also be laminated to an olefin film with a permanent type

acrylic pressure-sensitive adhesive, see column 5, lines 65 to 67.

According to example 1 the weatherable cast film formed from an alloy of an acrylic polymer and polyvinylidene fluoride is laminated to a PVC-film (bonding layer) with an acrylic adhesive, see column 7, lines 37 to 41.

According to examples 2 to 4 different materials for the bonding layer are employed. The same procedure is carried out as described in example1. Thus, an acrylic adhesive is employed to bond the weatherable cast film to the bonding layer.

According to example 5 a weatherable cast film formed from an alloy of an acrylic polymer and polyvinylidene fluoride is bonded to a PVC-film with an acrylic adhesive. The PVC-film again is bonded to a polypropylene film bonding layer with a polyester isocyanate adhesive, see column 8, lines 1 to 7.

According to example 6 a weatherable cast film formed from a fluoropolymer, an acrylate polymer, an urethane polymer, or a blend thereof is bonded with an acrylate adhesive to an ABS, PVC or nylon film (bonding layer) to form the decorative surfacing film, see column 8, lines 13 to 17.

Thus Ellison teaches that the weatherable liquid cast film is bonded to the bonding layer by using an adhesive This adhesive forms another layer between the cast film and the bonding layer.

The bonding layer, on the other hand, may be of the same material as the substrate layer which is applied to the molded surfacing film in a mold. If the molding material for the substrate is different from the material of the bonding layer another

layer may be introduced between the bonding layer and the substrate. This further layer may be formed of the material which will be used as the substrate. In example 5 a polypropylene film is bonded to the PVC bonding layer by using a polyester isocyanate adhesive. Later on, polypropylene is employed as a molding polymer which adheres to the polypropylene film. Thus, there may be an additional bonding layer which is formed of the same material as the polymer substrate. This further bonding layer is again bonded to the first bonding layer by using an adhesive.

Summing up, according to Ellison a liquid cast film and a bonding layer are employed which are formed of different polymers. In order to bond the liquid cast film to the bonding layer it is necessary to use an adhesive which forms an adhesive layer between the liquid cast film and the bonding layer.

According to the present invention it is not necessary to employ such adhesive layer since the transparent top layer and the substrate layer or the interlayer are bonded by (co)extrusion. Thus, the laminated sheets or films obtained according to Ellison and according to the present invention are substantially different. According to Ellison it is important to employ a substantially molecularly unoriented liquid cast film and not a melt cast film or films formed by melt extrusion in order to obtain the desired effects. Thus, Ellison actually teaches away from the sheets or films according to the present invention. *In re Baird 16 F.3d 380, 29USPQ 2d 1550(Fed. Cir. 1994).*

Claim 28 has been rejected under 35 USC 103 as being unpatentable over Ellison. This rejection is respectfully traversed.

This rejection is presumably also applied to claim 42. The explication of the rejection does not deal with the issue of (co)extrusion versus application of the liquid cast film and the use of a bonding layer, so it adds nothing to the rejection stated above and can not be considered to render the claim obvious.

Claim 24, 26, 27, 29, 31, 34, 35 39 and 40 have been rejected under 35 USC 103 as being unpatentable over Ellison in view of Fisher. This rejection is respectfully traversed.

Fischer does not at all relate to laminated films. To whatever extent some of the polymers disclosed by Fischer are similar or the same as some of the polymers that form part of the claimed laminated films it still would not provide the essential features lacking from Ellison as discussed above. Thus to whatever extent the two references may be appropriately combined, they would not result in or make obvious applicants claimed invention.

Claims 25, 30 and 32 have been rejected under 35 USC 103 as being unpatentable over Ellison in view of Fischer. For essentially the same reasons as those given above for the other claims this rejection is respectfully traversed.

This rejection differs from the one above only in that it relies on an additional hindsight conclusion of the examiner with regard to MFI values. The rejection shares the same errors as the previous one and for that reason alone is unsustainable.

Claim 35 has been rejected under 35 USC 103 as being unpatentable over Ellison in view of Fischer and Leca. Since claim 35 has been canceled, this rejection

has been obviated.

With response to the examiner's remarks concerning applicants' previous arguments, the following is noted.

The examiner has taken the position that "orientation is not inherent to a (co)extruded product, " particularly after the (co)extruded film has been relaxed through various forms of post-processing.

In the declaration of Dr. Grefenstein, referred to by the Examiner, results of shrinkage measurements according to DIN EN ISO 15015 on extruded polymer sheets of ASA/PC-blends as a substrate layer in PMMA as a transparent top layer were presented, see page 2 of the declaration. On page 2, lines 19 to 22 it was discussed that in a different system, 0.9 mm ASA/PC substrate layer and 0.1 mm PMMA top layer were employed. The shrinkage in extrusion direction was 27% and in perpendicular direction the elongation was 5%. The ASA/PC blend was composed of 40% ASA and 60% polycarbonate.

An additional shrinkage measurement was carried out on an identical sample which had been stored for more than two years. The material still showed a shrinkage in extrusion direction of 20% and a shrinkage in perpendicular direction of 3%. Thus, even after a prolonged time a high degree of shrinkage and thus a high degree of orientation was maintained in the product. Even after very long times the orientation induced by coextrusion does not totally relax. Annealing of the products does not totally relax the orientations either.

Furthermore, one of the inventors, Dr. Grefenstein, found that the orientation induced in the sheets or films by (co)extrusion does not significantly relax during the heating in a thermoforming or molding process.

Thus, the inventor could not find that the orientation is relaxed through thermoforming or molding as a post-processing step. For thermoformed and molded parts high longitudinal shrinkage values (in extrusion direction) of up to 25% have been measured for specific parts). All measurements were performed according to DIN EN ISO 15015.

If necessary, Dr. Grefenstein could provide an additional declaration to illustrate these findings, i.e. that the orientation remains even after prolonged times, annealing or post-processing.

Please find attached a check for $194.00 for a one month extension of time fee and one additional independent claim.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Cancel claims 25, 27-29 and 35.

Add new claims 41 and 42.

Amend claim 24 as follows:

24. (twice amended) A laminated sheet or film comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft

copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

[and]

a transparent top layer of polymethyl methacrylate

and optionally,

between the top layer and the substrate layer,

an (co)extruded interlayer of impact-modified polymethyl methacrylate, polycarbonate or a molding composition of said substrate layer without polycarbonate, if said substrate layer contains polycarbonate.

Add new claims 41 and 42 as follows:

41. (new) A laminated sheet or film comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

a transparent layer of polymethyl methacrylate and a transport protection film applied to the outside of said layer of polymethyl methacrylate.

42. (new) A laminated film comprising, in this order, the following (co)extruded layers:

a substrate layer comprising a member selected from the group consisting of ABS; polycarbonate; polybutylene terephthalate; polyethylene terephthalate; polyamide; polyetherimide; polyether ketone; polyphenylene sulfide; and polyphenylene ether or blends thereof, the substrate layer having a layer thickness of from 90 to 990 µm; and

a transparent top layer comprising a member selected from the group consisting of: polymethyl methacrylate; high-impact polymethyl methacrylate; ABS; polycarbonate; polyethylene terephthalate; styrene-acrylonitrile copolymers; polyamide; and polyether sulfone or polysulfone; the top layer having a layer thickness of from 10 to 100 µm;

and optionally,

between the top layer and the substrate layer,

an (co)extruded interlayer of a member selected from the group consisting of: polymethyl methacrylate; high-impact polymethyl methacrylate; ABS; polycarbonate; polyethylene terephthalate; styrene-acrylonitrile copolymers; polyamide; polyether sulfone or polysulfone, the interlayer comprising special-effect colorants and having a layer thickness of from 50 to 400 µm.

the substrate layer comprising special-effect colorants if the substrate layer and the top layer are composed of polyamide, the overall thickness of the laminated film being from 100 to 1000 µm.

FULL SET OF CLAIMS

24. A laminated sheet or film comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

a transparent top layer of polymethyl methacrylate

and optionally,

between the top layer and the substrate layer,

an (co)extruded interlayer of impact-modified polymethyl methacrylate, polycarbonate or a molding composition of said substrate layer without polycarbonate, if said substrate layer contains polycarbonate.

26. A laminated sheet or film as defined in claim 24, having an overall thickness of from 100 µm to 10 mm.

30. A laminated sheet or film as defined in claim 24, wherein the ratio of the MFI values of the individual components of the laminated sheet or film is not more than 3:1.

31. A molding comprising a shaped laminated sheet as defined in claim 24.

32. A molding comprising a shaped laminated sheet as defined in claim 24.

34. A molding as defined in claim 31 in the form of an automotive exterior bodywork component.

39. A laminated film comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

and

a transparent top layer of polymethyl methacrylate.

40. A laminated sheet or film, which is suitable for producing moldings, comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

and

a transparent top layer of polymethyl methacrylate.

41. A laminated sheet or film comprising the following (co)extruded layers:

a substrate layer comprising - based on the sum of the amounts of the following components A and B and, if used, C and/or D, which totals 100% by weight -

1 - 99% by weight component A, which is of a graft copolymer of

1 - 99% by weight of a particulate graft base A1 comprising the following monomers:

80 - 99.99% by weight of at least one C_{1-8}-alkyl ester of acrylic acid as component A11;

0.01 -20% by weight of at least one polyfunctional crosslinking monomer as component A12;

1 - 99% by weight of a graft A2 comprising the following monomers, based on A2:

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component A21 and

up to 60% by weight of units of acrylonitrile or methacrylonitrile as component A22;

the graft A2 comprising at least one graft shell and the graft copolymer having a mean particle size of 50 - 1000 nm;

1 - 99% by weight of component B, which is a copolymer of

40 - 100% by weight of units of styrene, a substituted styrene or a (meth)acrylate, or mixtures thereof, as component B1, and

up to 60% by weight of acrylonitrile or methacrylonitrile as component B2;

0 - 80% by weight of component C, which is a polycarbonate; and

0 - 50% by weight of component D, which is a fibrous or particulate filler or mixtures thereof;

a transparent layer of polymethyl methacrylate and a transport protection film applied to the outside of said layer of polymethyl methacrylate.

42. A laminated film comprising, in this order, the following (co)extruded layers:

a substrate layer comprising a member selected from the group consisting of ABS; polycarbonate; polybutylene terephthalate; polyethylene terephthalate; polyamide; polyetherimide; polyether ketone; polyphenylene sulfide; and polyphenylene ether or blends thereof, the substrate layer having a layer thickness of from 90 to 990 µm; and

a transparent top layer comprising a member selected from the group consisting of: polymethyl methacrylate; high-impact polymethyl methacrylate; ABS; polycarbonate; polyethylene terephthalate; styrene-acrylonitrile copolymers;

polyamide; and polyether sulfone or polysulfone; the top layer having a layer thickness of from 10 to 100 µm;

and optionally,

between the top layer and the substrate layer,

an (co)extruded interlayer of a member selected from the group consisting of: polymethyl methacrylate; high-impact polymethyl methacrylate; ABS; polycarbonate; polyethylene terephthalate; styrene-acrylonitrile copolymers; polyamide; polyether sulfone or polysulfone, the interlayer comprising special-effect colorants and having a layer thickness of from 50 to 400 µm.

the substrate layer comprising special-effect colorants if the substrate layer and the top layer are composed of polyamide, the overall thickness of the laminated film being from 100 to 1000 µm.